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## Transformasi Terstruktur

### 1. Teori Singkat

Data warehouse adalah jenis sistem manajemen data yang dirancang untuk memungkinkan dan mendukung kegiatan business intelligence (BI), terutama analitik. Gudang data semata-mata dimaksudkan untuk melakukan kueri dan analisis dan sering berisi sejumlah besar data historis. Data dalam gudang data biasanya berasal dari berbagai sumber seperti file log aplikasi dan aplikasi transaksi. Gudang data memusatkan dan mengkonsolidasikan sejumlah besar data dari berbagai sumber. Kemampuan analitisnya memungkinkan organisasi untuk memperoleh wawasan bisnis yang berharga dari data mereka untuk meningkatkan pengambilan keputusan. Seiring waktu, ia membangun catatan sejarah yang dapat sangat berharga bagi para ilmuwan data dan analis bisnis. Karena kemampuan ini, gudang data dapat dianggap sebagai "sumber kebenaran tunggal" organisasi.

### 2. Alat dan Bahan

Hardware : Laptop/PC

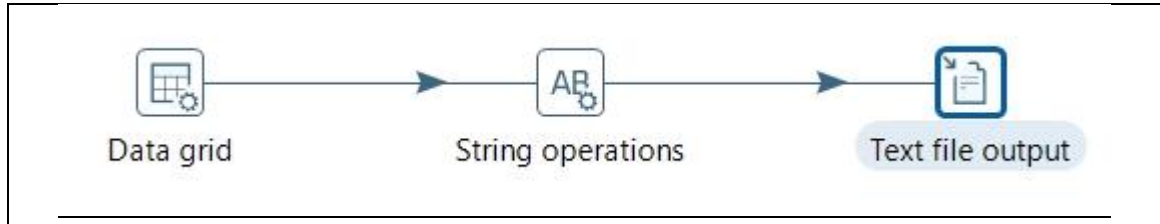
Software : Spoon Pentaho from Hitachi Vantara



### 3. Elemen Kompetensi

#### a. Latihan pertama – Membuat Transformasi Terstruktur

1. Buat transformation sheet baru, lalu save dan beri nama Header. Buatlah struktur transformasi seperti pada gambar.



#### 2. Header Transformation – Data Grid.

**Meta Tab:**

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Null if	Set empty string?
1	Usia	String								N
2	Kelompok Usia	String								N

**Data Tab:**

#	Usia	Kelompok Usia
1	Usia	Kelompok Usia

#### 3. Header Transformation – String operations (Get fields & custom).



String operations

Step name String operations

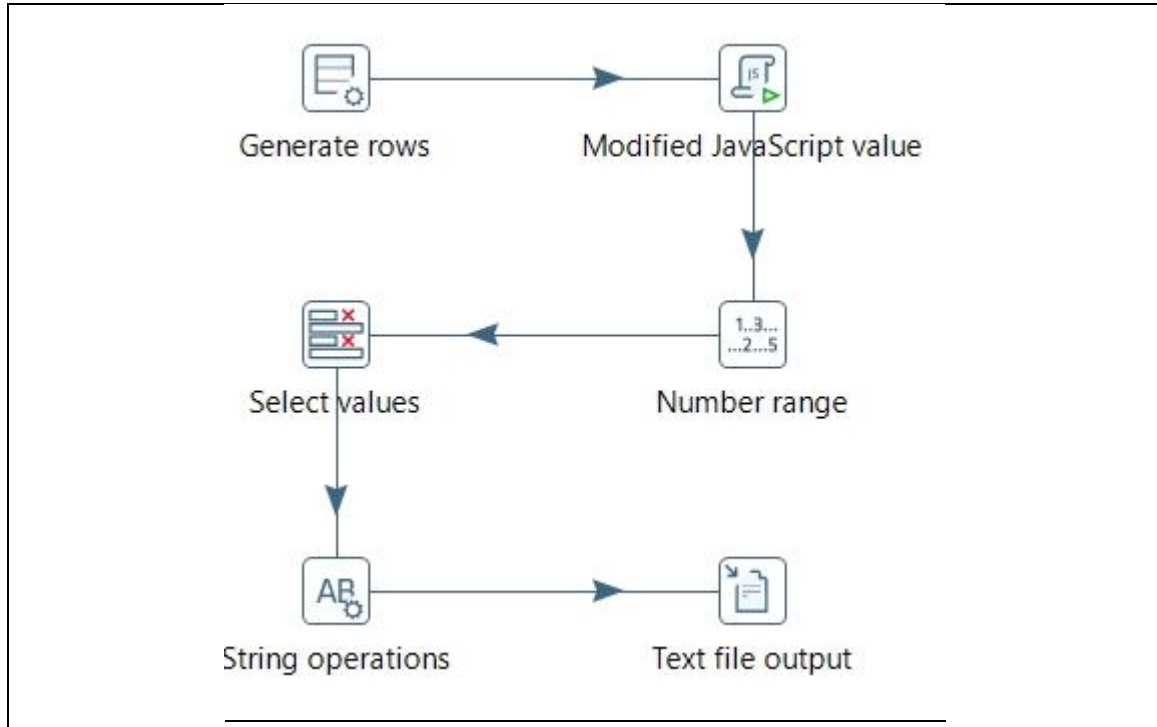
the fields to process:

#	In stream field	Out stream field	Trim type	Lower/Upper	Padding	Pad char	Pad Length	InitCap	Escape	Digits	Remove Special character
1	Usia		none	none	right		10	no	none	none	none
2	Kelompok Usia		none	none	right		20	no	none	none	none
3											

#### 4. Header Transformation – Text file output (Get fields & custom).

[illegible]

5. Buat transformation sheet baru, lalu save dan beri nama Data lalu buatlah struktur transformasi seperti pada gambar dibawah ini.



#### 6. Data Transformation – Generate rows.

Generate rows

Step name: Generate rows

Limit: 100

Never stop generating rows: ☐

Interval in ms (delay): 5000

Current row time field name: now

Previous row time field name: FiveSecondsAgo

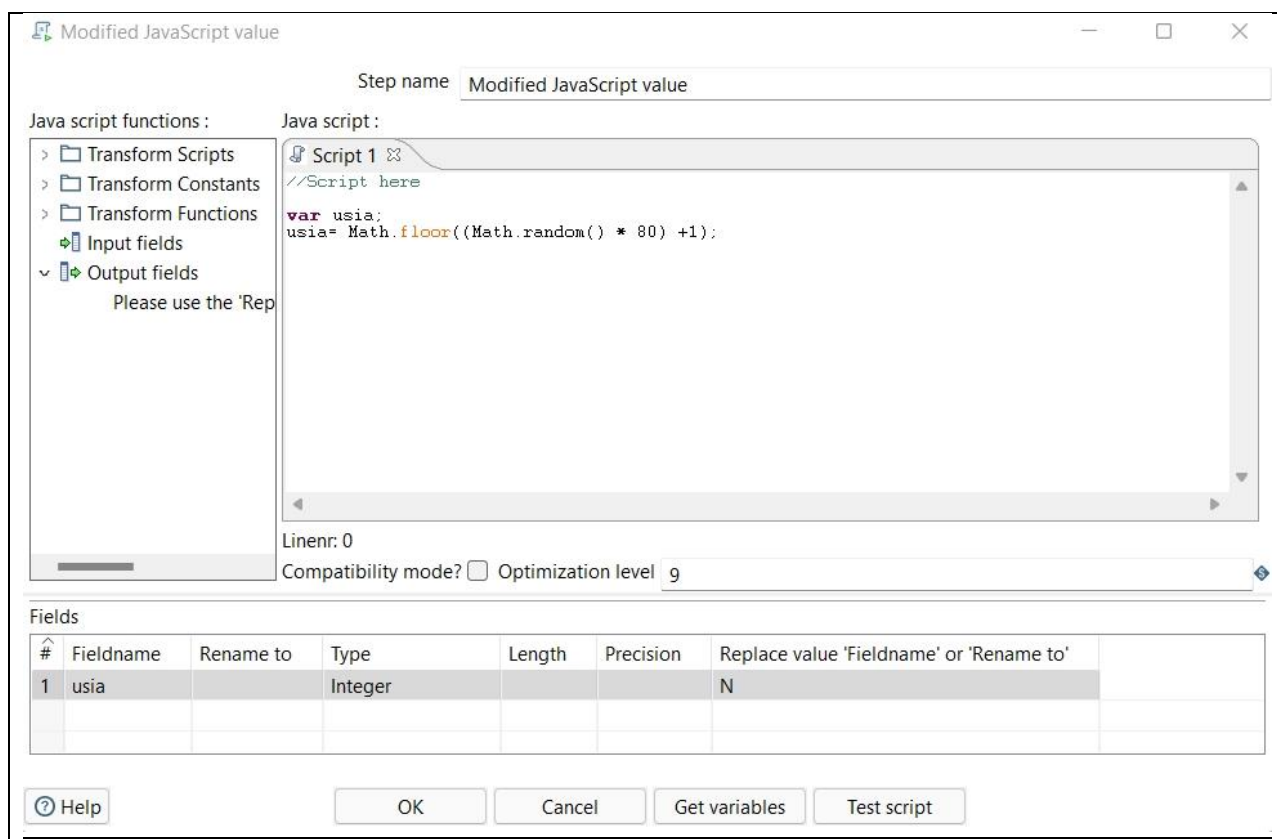
Fields :

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Value	Set empty string?
1										

Help OK Preview Cancel

#### 7. Data Transformation – Modified Java Script Value.





## 8. Data Transformation – Number Range.



Number range

Step name: Number range

Input field: usia

Output field: kelompok

Default value(if no range) unknown

Ranges (min <= x < max):

#	Lower Bound	Upper Bound	Value
1		6.0	Balita
2	6.0	12.0	Kanak-Kanak
3	12.0	17.0	Remaja
4	17.0	24.0	Pemuda
5	24.0	55.0	Dewasa
6	55.0		Tua

Help OK Cancel

9. Data Transformation – Select values (Get fields to change & custom).

Select values

Step name: Select values

Select & Alter Remove Meta-data

Fields to alter the meta-data for :

#	Fieldname	Rename to	Type	Length	Precision	Binary to Normal?
1	usia		String	10		N
2	kelompok		String	20		N

Get fields to change

Help OK Cancel

10. Data Transformation – String operations (Get fields to change & custom).



**String operations**

Step name String operations

The fields to process:

#	In stream field	Out stream field	Trim type	Lower/Uppercase	Padding	Pad char	Pad Length	InitCap	Escape	Digits	Remove Special character
1	usia		none	none	right		10	N	None	none	none
2	kelompok		none	none	right		20	N	None	none	none

Help OK Get fields Cancel

## 11. Data Transformation – Text file output (Browse & Get fields)



[illegible]

12. Buat Job sheet baru lalu simpan dengan nama Job, dan buat struktur seperti gambar dibawah (Gunakan 2 Transformation yang diberi nama Header dan Data).



13. Job – Header (browse file dan cari tempat kamu menyimpan file transformation Header.ktr lalu klik OK)

Transformation

Entry Name:  
Header

Transformation:  
D:/file kuliah smstr4/fileprakdatawarehouse/Head Browse...

Options Logging Arguments Parameters

Run configuration:  
Pentaho local

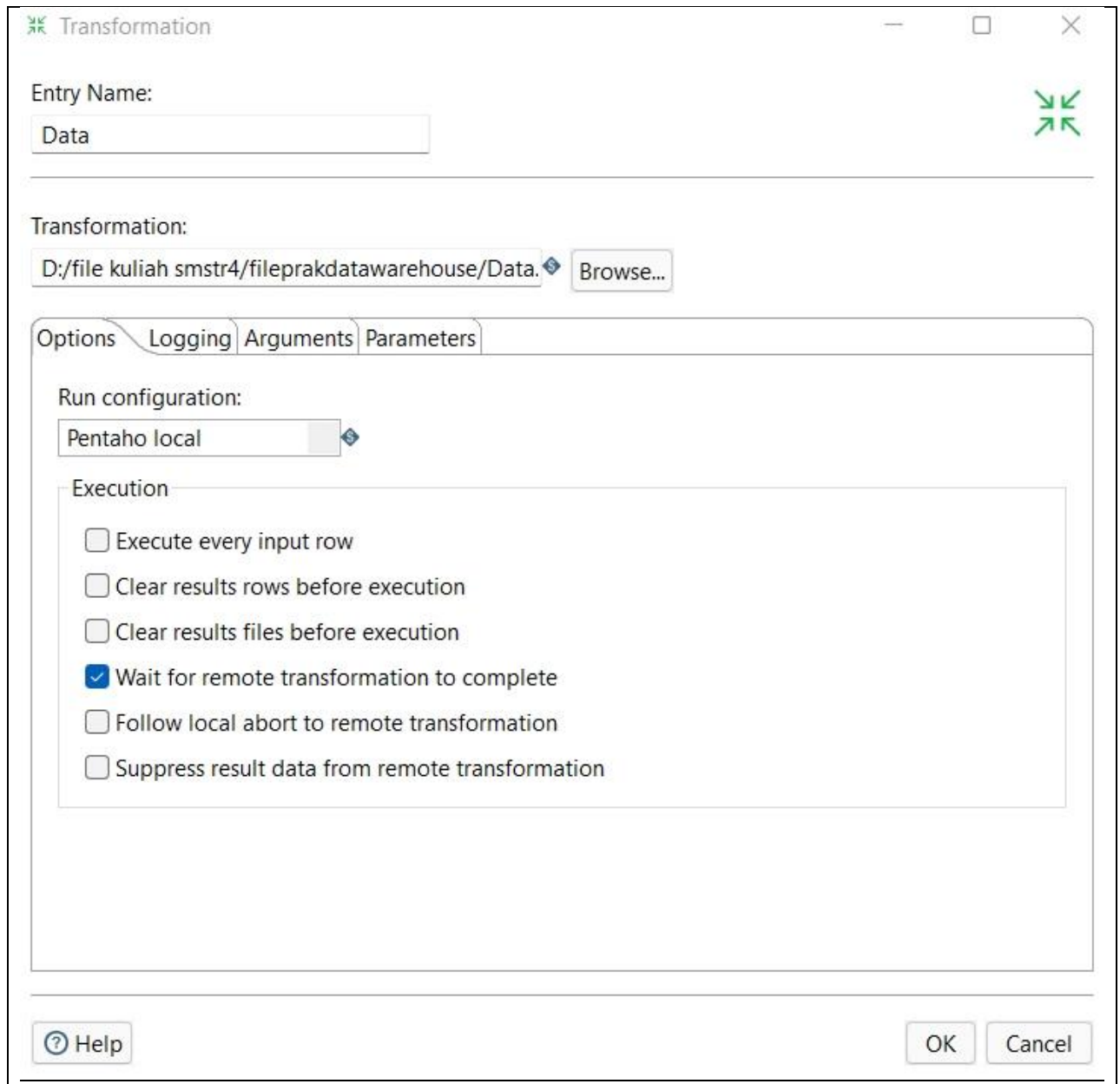
Execution

- ☐ Execute every input row
- ☐ Clear results rows before execution
- ☐ Clear results files before execution
- ☒ Wait for remote transformation to complete
- ☐ Follow local abort to remote transformation
- ☐ Suppress result data from remote transformation

Help OK Cancel

14. Job – Data (browse file dan cari tempat kamu menyimpan file transformation Data.ktr lalu klik OK)





The image shows a screenshot of the 'Transformation' configuration window in Pentaho. The window has a title bar with a green icon and standard window controls. The 'Entry Name' field is set to 'Data'. The 'Transformation' field shows the path 'D:/file kuliah smstr4/filepraktikdatawarehouse/Data.' with a 'Browse...' button. Below this are tabs for 'Options', 'Logging', 'Arguments', and 'Parameters'. The 'Options' tab is active, showing 'Run configuration' set to 'Pentaho local'. Under the 'Execution' section, there are several checkboxes: 'Execute every input row' (unchecked), 'Clear results rows before execution' (unchecked), 'Clear results files before execution' (unchecked), 'Wait for remote transformation to complete' (checked), 'Follow local abort to remote transformation' (unchecked), and 'Suppress result data from remote transformation' (unchecked). At the bottom, there are 'Help', 'OK', and 'Cancel' buttons.

Transformation

Entry Name:  
Data

Transformation:  
D:/file kuliah smstr4/filepraktikdatawarehouse/Data. Browse...

Options Logging Arguments Parameters

Run configuration:  
Pentaho local

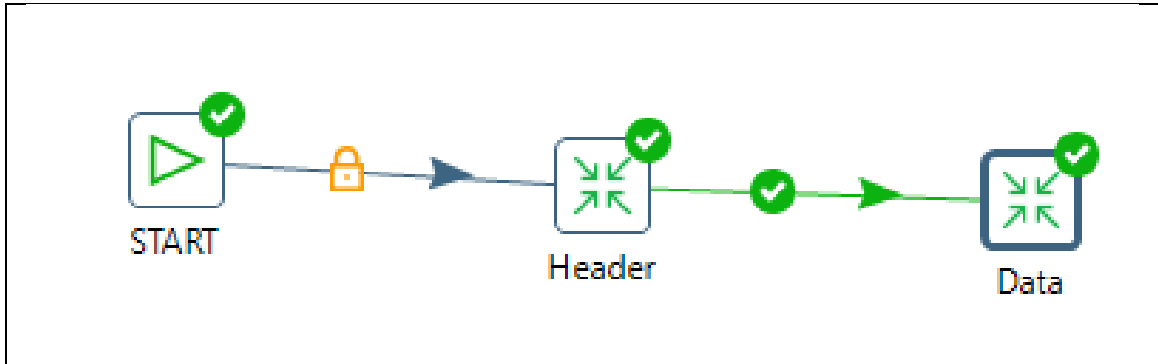
Execution

- ☐ Execute every input row
- ☐ Clear results rows before execution
- ☐ Clear results files before execution
- ☒ Wait for remote transformation to complete
- ☐ Follow local abort to remote transformation
- ☐ Suppress result data from remote transformation

Help OK Cancel

15. Lalu jalankan/running Job.





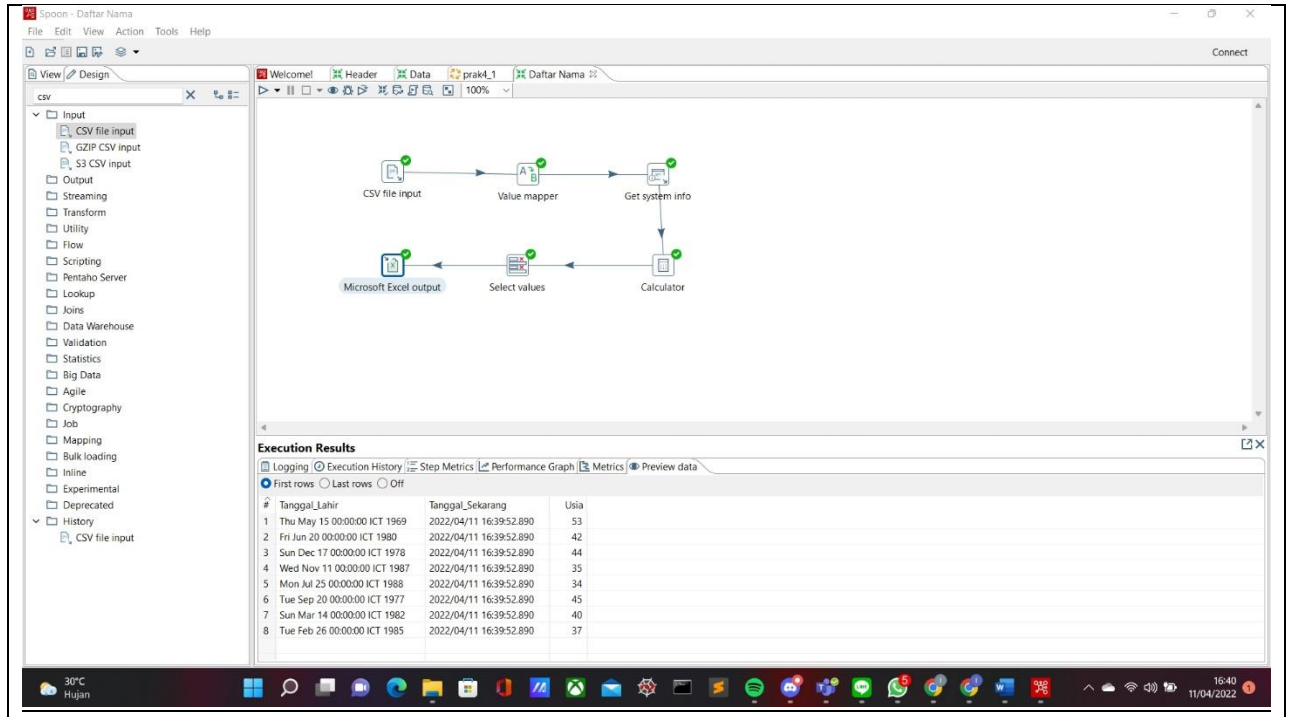
16. Berikut Outputnya

usia;kelompok
21 ;Pemuda
56 ;Tua
29 ;Dewasa
46 ;Dewasa
60 ;Tua
29 ;Dewasa
1 ;Balita
71 ;Tua
30 ;Dewasa
15 ;Remaja
71 ;Tua
79 ;Tua
69 ;Tua
14 ;Remaja
30 ;Dewasa
25 ;Dewasa
43 ;Dewasa
4 ;Balita
65 ;Tua
63 ;Tua
67 ;Tua
69 ;Tua
12 ;Remaja
40 ;Dewasa

b. Latihan Kedua – Transformasi Data CSV to Excel



1. Buat Transformasi baru dengan nama Daftar nama dan buat seperti pada gambar dibawah



2. Text file Input (Pada bagian fields klik Get Fields dan Custom sesuai pada gambar).



Text file input

Step name: Text file input

File | Content | Error Handling | Filters | Fields | Additional output fields

File or directory:  Add Browse...

Regular Expression:

Exclude Regular Expression:

Selected files:

#	File/Directory	Wildcard (RegExp)	Exclude wildcard	Required	Include subfolders
1	\$(Internal.Entry.Current.Directory)/Daftar Nama.csv			N	N

Accept filenames from previous steps

Accept filenames from previous step ☐

Pass through fields from previous step ☐

Step to read filenames from:

Field in the input to use as filename:

Show filename(s)... Show file content Show content from first data line

Help OK Preview rows Cancel

Text file input

Step name: Text file input

File | Content | Error Handling | Filters | Fields | Additional output fields

#	Name	Type	Format	Position	Length	Precision	Currency	Decimal	Group	Null if	Default	Trim type	Repeat
1	Nama	String			6		\$	.	,	-		none	N
2	Jenis_Kelamin	String			1		\$	.	,	-		none	N
3	Tanggal_Lahir	Date	dd-MM-yyyy				\$	.	,	-		none	N
4													

### 3. Value Mapper

Value mapper

Step name: Value mapper

Fieldname to use: Jenis\_Kelamin

Target field name (empty=overwrite):

Default upon non-matching:

Field values:

#	Source value	Target value
1	P	Perempuan
2	L	Laki-Laki

Help OK Cancel

### 4. Get system info.



Get system info

Step name: Get system info

Fields:

#	Name	Type
1	Tanggal_Sekarang	system date (fixed)

Help OK Preview rows Cancel

## 5. Calculator.

Calculator

Step name: Calculator

☒ Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Precision	Remove	Conversion mask	Decimal symbol	Grouping symb
1	Tahun_Lahir	Year of date...	Tanggal_Lahir			Integer			Y			
2	Tahun_Sekarang	Year of date...	Tanggal_Sekarang			Integer			Y			
3	Usia	A - B	Tahun_Sekarang	Tahun_Lahir		Integer			N	#		

Help OK Cancel

## 6. Select values (Get fields & delete some fieldname).

Select values

Step name: Select values

Select & Alter Remove Meta-data

Fields:

#	Fieldname	Rename to	Length	Precision
1	Tanggal_Lahir			
2	Tanggal_Sekarang			
3	Usia			

Get fields to select Edit Mapping

Include unspecified fields, ordered by name ☐

Help OK Cancel

## 7. Microsoft Excel output.



Microsoft Excel output

Step name Microsoft Excel output

File Content Custom Fields

Filename D:\file kuliah smstr4\fileprakdatawareh Browse...

Create Parent folder ☐

Do not create file at start ☐

Extension xls

Include stepnr in filename? ☐

Include date in filename? ☐

Include time in filename? ☐

Specify Date time format ☐

Date time format

Show filename(s)...

Add filenames to result ☒

Help OK Cancel





The screenshot shows a window titled "Microsoft Excel output". At the top, there's a label "Step name" followed by a text field containing "Microsoft Excel output". Below this are four tabs: "File", "Content", "Custom", and "Fields". The "Fields" tab is selected. Inside the "Fields" tab, there is a table with four columns: "#", "Name", "Type", and "Format". The table contains three rows of data:

#	Name	Type	Format
1	Tanggal_Lahir	Date	
2	Tanggal_Sekarang	Date	
3	Usia	Integer	

Below the table, there are two buttons: "Get Fields" and "Minimal width". At the bottom of the window, there are three buttons: "? Help", "OK", and "Cancel".

## 8. Output setelah di running

The screenshot displays the Apache NiFi web console. On the left, a sidebar shows a tree view of components categorized under 'Input', 'Output', 'Streaming', 'Transform', 'Utility', 'Flow', 'Scripting', 'Penaho Server', 'Lookup', 'Joins', 'Data Warehouse', 'Validation', 'Statistics', 'Big Data', 'Agile', 'Cryptography', 'Job', 'Mapping', 'Bulk loading', 'Inline', 'Experimental', 'Deprecated', and 'History'. The main canvas shows a data flow diagram with the following components: 'CSV file input' (green), 'Value mapper' (green), 'Get system info' (green), 'Microsoft Excel output' (blue), 'Select values' (green), and 'Calculator' (green). The flow is: CSV file input → Value mapper → Get system info → Calculator → Select values → Microsoft Excel output. Below the canvas, the 'Execution Results' tab is active, showing a table of data.

#	Tanggal_Lahir	Tanggal_Sekarang	Usia
1	Thu May 15 00:00:00 ICT 1969	2022/04/11 16:39:52.890	53
2	Fri Jun 20 00:00:00 ICT 1980	2022/04/11 16:39:52.890	42
3	Sun Dec 17 00:00:00 ICT 1978	2022/04/11 16:39:52.890	44
4	Wed Nov 11 00:00:00 ICT 1987	2022/04/11 16:39:52.890	35
5	Mon Jul 25 00:00:00 ICT 1988	2022/04/11 16:39:52.890	34
6	Tue Sep 20 00:00:00 ICT 1977	2022/04/11 16:39:52.890	45
7	Sun Mar 14 00:00:00 ICT 1982	2022/04/11 16:39:52.890	40
8	Tue Feb 26 00:00:00 ICT 1985	2022/04/11 16:39:52.890	37

## 4. File Praktikum

Github Repository:

<https://github.com/IbnuFajar7/Data-Warehouse/tree/main/Prak-4>

## 5. Soal Latihan

Soal:

1. Apa yang dimaksud dengan Transformasi Terstruktur?
2. Apa perbedaan penggunaan Job dan Transformation pada Spoon?

Jawaban:

1. Transformasi yang dilakukan dan diatur secara terstruktur, tidak secara acak karena memang sudah diatur sedemikian rupa agar file inputan tidak teracak kemana-mana.
2. Transformation: sekumpulan instruksi untuk merubah input menjadi output yang diinginkan (input- proses-output).

Job: Mengatur urutan transformasi. Penjadwalan transformasi. Pengecekan kondisi sebelum dilakukan transformasi.



## 6. Kesimpulan

- Dalam pengerjaan praktikum Data Warehouse, kita harus benar-benar teliti dalam menginputkan suatu fungsi untuk menampilkan suatu keluaran pada layar dengan sesuai.
- Kita dapat mengetahui cara kerja transformation dan job, di praktikum ini sudah dijelaskan kita membuat suatu transformation yaitu Header dan Data, kemudian kita gabungkan keduanya di dalam file Job.

## 7. Cek List (✓)

No	Elemen Kompetensi	Penyelesaian	
		Selesai	Tidak Selesai
1.	Latihan Pertama	✓	
2.	Latihan Kedua	✓	

## 8. Formulir Umpan Balik

No	Elemen Kompetensi	Waktu Pengerjaan	Kriteria
1.	Latihan Pertama	10 Menit	1
2.	Latihan Kedua	10 Menit	1

Keterangan:

- Menarik
- Baik
- Cukup
- Kurang

